Chapter 1: Introduction to Web Development – Notes & Solutions

PART I: Short Questions

1. What is a Web Application?

- A **web application** is a software program that runs on a server and is accessed using a browser.
- It performs tasks over the internet (e.g., Gmail, Google Docs, Facebook).
- Example: **Online shopping cart** where users select items and checkout.

2. What is a Website and a Web Page?

- **Website:** A collection of interlinked web pages under one domain (e.g., www.fpsc.gov.pk).
- **Web Page:** A single document written in HTML, accessible in a browser (e.g., FPSC "Jobs" page).

3. What is HTML?

- **HTML (HyperText Markup Language)** is the standard language for creating web pages.
- It uses **tags** like <h1>, <p>, <table>.
- Example:

```
<!DOCTYPE html>
<html>
 <head><title>My Page</title></head>
 <body><h1>Hello World</h1></body>
</html>
```

4. What is HTTP?

- **HTTP (HyperText Transfer Protocol)** is the set of rules for communication between client (browser) and server.
- It transfers text, images, videos, etc.

5. What is an HTTP Request?

- A **request sent by the client** (browser) to the server asking for resources (page, file, data).
- Example: Entering www.google.com → browser sends HTTP request to Google's server.

6. What is a GET Method?

- Used to request data from a server.
- Data is sent in the **URL**.
- Example:

```
https://example.com/search?query=java
```

7. Define POST Method.

- Used to **send data securely** to a server.
- Data is sent in the **request body** (not visible in URL).
- Example: Submitting a login form with username & password.

8. What is Server-Side Programming? Write names of server-side programming languages.

- Runs on the **server**, processes requests, interacts with databases.
- Languages: **PHP, Java, Python, ASP.NET, Ruby**.

9. What is Client-Side Programming? Write names of some client-side programming languages.

- Runs on the **user's browser**, handles UI/UX.
- Languages: **JavaScript, HTML, CSS, VBScript**.

10. Define JavaScript.

- A **scripting language** used for dynamic behavior in web pages.
- Example:

```
<script>
 alert("Welcome to my website!");
</script>
```

11. What is an Application Layer?

- The **logic tier** in a 3-layer architecture.
- Processes user requests, applies business rules, communicates with the database.

12. Write two benefits of three-layer model of web application layers.

1. **Scalability:** Each layer can be upgraded independently.
2. **Security:** Presentation layer and database layer do not directly interact; the application layer acts as a firewall.

PART II: Long Questions

1. What is a Web Application? Describe in detail.

- A **web app** is software that runs on a server and accessed via a browser.
- Examples: Gmail, YouTube, Online Banking.
- **Working:** Client (browser) → sends HTTP request → Server processes request → Database → sends response back.
- **Benefits:**
    - Runs on any device/browser
    - No installation required
    - Easy updates and maintenance

2. What is HTTP? How it Works?

- **HTTP** is an application layer protocol used for data communication on the web.
- **Working:**
    1. Client sends **HTTP request** (GET/POST).
    2. Server processes request.
    3. Server sends back **HTTP response** (HTML page, data).
- Example: Searching "Java tutorial" on Google uses HTTP.

3. Compare HTTP GET and POST methods.

Feature	GET Method	POST Method
Data transfer	In URL	In request body

Feature	GET Method	POST Method
Security	Less secure (data visible in URL)	More secure (data hidden)
Use case	Searching, fetching	Login forms, payments
Example	example.com?id=5	Login form data

4. Describe Server-Side Programming Languages.

- **Server-side programming** handles business logic, database access, and dynamic content.
- **Languages:**
  - **PHP** (used in WordPress)
  - **Java (JSP/Servlets)**
  - **Python (Django, Flask)**
  - **ASP.NET**
- Example: When user logs in, server-side code checks credentials in database.

5. Describe Web Application Layers.

- **Presentation Layer:** User interface (HTML, CSS, JavaScript).
- **Application Layer:** Business logic (Java, PHP, Python).
- **Data Layer:** Database management (MySQL, Oracle).
- **Benefits:** Scalability, Security, Faster development .

Extra Important Short Questions with Answers

Q1. Differentiate between Website and Web Application.

- **Website:** Collection of static/dynamic web pages providing information.
- **Web Application:** Interactive program that allows user to perform tasks (login, shopping).
- Example:
  - Website: www.bbc.com (just information).
  - Web Application: www.gmail.com (login, send/receive emails).

Q2. What is the World Wide Web (WWW)?

- The **WWW** is a system of interlinked web pages accessible through the internet.
- It uses **HTTP protocol** for communication between client and server.
- Example: Opening www.google.com loads a page from WWW.

Q3. What is the Client-Server Model?

- A **client** requests a service, and a **server** provides it.
- Example: Browser (client) → requests Google homepage → Server responds with HTML page.

Q4. Write any two examples of Client-Side and Server-Side Languages.

- **Client-Side:** JavaScript, CSS
- **Server-Side:** PHP, Java

Q5. Define Protocol. Give examples.

- A **protocol** is a set of rules for communication between computers.
- Examples: **HTTP, FTP, TCP/IP**.

Q6. What are Static and Dynamic Web Pages?

- **Static Page:** Same content for every user (e.g., About Us page).
- **Dynamic Page:** Content changes according to user input/database (e.g., Facebook profile page).

Q7. Write two benefits of Web Applications over Desktop Applications.

1. No installation required; runs on browser.
2. Can be accessed from anywhere using the internet.

Q8. What is the difference between Internet and Web?

- **Internet:** A global network of connected computers.
- **Web:** A collection of websites and resources accessible via the Internet using HTTP.

Q9. Define SaaS with example.

- **SaaS (Software as a Service):** Software provided online via subscription.
- Example: Google Docs, Microsoft 365.

Q10. What is URL? Give an example.

- **URL (Uniform Resource Locator):** The address used to access resources on the web.
- Example: https://www.fpsc.gov.pk/jobs

⭐ **Extra Important Long Questions with Answers**

Q1. Explain the benefits of Web Applications.

- Platform independent (works on any device/browser).
- Easy to update (same version for all users).
- Saves storage (no need to install software).
- Cost-effective (less maintenance).
- Example: Gmail works on PC, mobile, and tablets.

Q2. Differentiate between Client-Side and Server-Side Programming.

Aspect	**Client-Side**	**Server-Side**
Where it runs	User's browser	Server
Languages	HTML, CSS, JavaScript	PHP, Java, Python
Function	UI/Interaction	Database, business logic
Example	Form validation	Login authentication

Q3. Explain the Three-Layer Model of Web Applications.

1. **Presentation Layer:** User interface (HTML, CSS, JS).
    - Example: Login form.
2. **Application Layer:** Business logic (Java, PHP).

- Example: Checking username/password.

3. **Data Layer:** Database (MySQL, Oracle).
   - Example: Storing user details.
     Benefits: Scalability, Security, Independent development.

Q4. What is the difference between HTTP and HTTPS?

- **HTTP (HyperText Transfer Protocol):** Normal communication, not encrypted.
- **HTTPS (HyperText Transfer Protocol Secure):** Secure communication using SSL/TLS encryption.
- Example:
  - http://example.com → not secure.
  - https://bank.com → secure (used for banking, e-commerce).

Q5. Compare Static vs Dynamic Web Applications.

Feature	Static Web App	Dynamic Web App
Content	Fixed, same for all users	Changes based on user input
Example	Portfolio website	Online Banking
Language	HTML, CSS	PHP, JSP, ASP.NET
Database	Not required	Required